

What is claimed is:

1. A system for delivery of a tissue supporting device to a bifurcated body lumen, the system comprising:

a catheter with an inflatable balloon, the inflatable balloon configured to deliver an expandable tissue supporting device to the lumen;

a guide member received on a side of the balloon and connected to the catheter; and

a branch lumen guidewire extending along an exterior of the balloon and longitudinally slidable in the guide member.

2. The system of Claim 1, wherein the guide member extends radially from the side of the balloon and is arranged to be received in a side hole of a tissue supporting device mounted on the balloon.

3. The system of Claim 1, wherein the guide member includes a guide loop.

4. The system of Claim 1, further comprising a tissue supporting device mounted on the balloon, and the branch lumen guidewire is slidable along an exterior of the tissue supporting device.

5. The system of Claim 4, wherein the guide member is positioned between the tissue supporting device and the balloon and is crimped in place by crimping of the tissue supporting device onto the balloon.

6. The system of Claim 1, wherein the guide member includes a fastener connected to the catheter.

1 7. The system of Claim 6, wherein the fastener includes a crimping lug which
2 is connected to a body of the guide member by a tether.

1 8. The system of Claim 1, wherein the guide member includes first and second
2 guide loops which are arranged to be received in side holes of a tissue supporting device
3 mounted on the balloon.

1 9. A guide member for use in delivery of a tissue supporting device to a
2 bifurcated body lumen in a desired longitudinal and radial position, the guide member
3 comprising:

4 a guide loop for receiving a guidewire;

5 means for securing the guide loop to a catheter; and

6 at least one tab extending from the guide loop for holding the guide loop in
7 position in a side hole of a tissue supporting device to be delivered.

1 10. The guide member of Claim 9, wherein the at least one tab is a curved
2 member having a radius of curvature which corresponds substantially to an inner radius of
3 the tissue supporting device to be delivered.

1 11. The guide member of Claim 9, wherein the guide loop and at least one tab
2 are formed from a single piece of tubing.

1 12. The guide member of Claim 9, wherein the means for securing the guide
2 loop to a catheter includes a crimping lug which is connected to the guide loop by a tether.

1 13. The guide member of Claim 9, further comprising a spacer member
2 connected to the guide loop and configured to space the guide loop a predetermined
3 distance from a distal edge of the side hole of the tissue supporting device when the guide
4 loop is positioned in the side hole of the tissue supporting device.

1 14. The guide member of Claim 9, further comprising an auxiliary guide loop
2 positioned proximally of the guide loop.

1 15. A method of delivering of a tissue supporting device to a bifurcated body
2 lumen comprising:
3 providing an expandable tissue supporting device in an unexpanded
4 configuration, the tissue supporting device having a side hole;
5 positioning a guide member in the side hole;
6 positioning a side branch guidewire in a body lumen with a distal end of the
7 side branch guidewire extending into a side branch of a bifurcation;
8 delivering the tissue supporting device into the body lumen by tracking the
9 guide member along the side branch guidewire;
10 positioning the tissue supporting device with the side hole aligned radially
11 and longitudinally with an opening of the side branch; and
12 expanding the tissue supporting device.

1 16. The method of Claim 15, wherein the tissue supporting device is delivered
2 and expanded by a balloon catheter.

1 17. The method of Claim 15, wherein the guide member is positioned in the side
2 hole such that a guide loop of the guide member extends out of the side hole of the tissue
3 supporting device.

1 18. The method of Claim 15, wherein the tissue supporting device is expanded
2 by expanding a distal segment of the tissue supporting device, removing the side branch
3 guidewire from the guide member, and then expanding a proximal segment of the tissue
4 supporting device.

1 19. The method of Claim 15, further comprising delivering a second tissue
2 supporting device to support the side branch of the bifurcation.

1 20. The method of Claim 19, wherein the second tissue supporting device
2 includes a side hole and is delivered by a method comprising:
3 positioning a second guide member in the side hole;
4 positioning a guidewire in the body lumen with a distal end of the guidewire
5 extending into the expanded tissue supporting device;
6 delivering the second tissue supporting device into the body lumen by
7 tracking the second guide member along the guidewire;
8 positioning the second tissue supporting device with the side hole aligned
9 radially and longitudinally with an opening of a main branch of the bifurcation; and
10 expanding the second tissue supporting device.

1 21. The method of Claim 15, wherein the delivery of the tissue supporting
2 device is visualized by fluoroscopy.

1 22. The method of Claim 17, wherein an auxiliary guide loop extends out of an
2 auxiliary side hole of the tissue supporting device.